





Partnering Outside the Box Digital and Artificial

Intelligence Integrated Tools to Support Higher Education Students with Dyslexia

### ToT: Training of Trainers

Enrique Yeguas, PhDc Pilar Aparicio, PhD Sara Pinzi, PhD





### Familiarization VR







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### Contents:

- VR Concepts
- Oculus (Meta) Quest 2
- Quest Setup
- Home environment
- VR Tips
- VR Apps Test & Analysis













# **Mixed Reality Continuum**





[Milgram and Kishino 1994]

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### Virtual Reality VR

### Mixed Reality MR

Augmented Reality AR

SAMSUNG

# **History of Virtual Reality**

ransferring Technology to nerican Industry and Gove TechBr

July/August 198





Wearable head-mounted display with wide field-of-view LEEP optics, created by McGreevy and Humphries.









Circa 1985







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### Definition

# virtual reality

noun

#### Simple Definition of VIRTUAL REALITY

: an artificial world that consists of images and sounds created by a computer and that is affected by the actions of a person who is experiencing it

Source: Merriam-Webster's Learner's Dictionary







# **Other definitions**

- Electronic simulations of environments experienced via head mounted eye goggles and wired clothing enabling the end user to interact in realistic threedimensional situations. (Coates, 1992)
- An alternate world filled with computergenerated images that respond to human movements. (Greenbaum, 1992)



4 Focus Points When Designing for VR







# **Virtual Reality Goal**

- Take human senses (interfaces)
  - Visual
  - Audial
  - Haptic/Tactile
  - Scent
  - Taste

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- Neural
- Replace with computer generated data
  - Dynamics, visuals, AI, networking
    - Basically everything in science...!
- Create sense of immersion



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## **Elements of Virtual Reality**

- Virtual Environment
- Immersion
- Interactivity
- Participants
- Creators

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# **Categories of VR**

### Desktop VR

- 3D world shown on monitor, mouse and keyboard input to interact.
- Low cost, standard PC.
- Games, Simulators.

### Augmented Reality

• A seamless mix between real world and Computer Graphics (CG) as well as sound.

### Telepresence

• The use of various technologies to produce the effect of placing the user in another location.

### Immersive VR

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- Using other display technologies (helmets, walls, ..
- User tracked in some sense.



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## **Immersive VR**

- Head mounted displays, gloves or controllers.
- Separation from the real world.











## **Immersive VR: Oculus Quest**

- Standalone all-in-one VR system.
- Hand presence. Touch controllers.
- 6 degrees of freedom.
- Inside-out tracking.
- Buit-in audio.





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### **Oculus Quest 2: Unboxing**



## **Oculus Quest 2: Headset**

- Mass: 503 g.
- Display panel: LCD.
- Resolution: 1.920 x 1.832 per eye
- Refresh rate: 90-120 Hz.
- Storage: 64, 128, 256 GB.
- Memory: 6 GB.
- System on a chip: Snapdragon XR2.
- Graphics: Adreno 650.
- Operating system: Android-based.









## **Oculus Quest 2: Headset**



### **OQ 2: Touch Controllers**



**Oculus Touch Right Hand Controller** 

## **Oculus Quest 2: Lights**



#### Headset is plugged in (charging)

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WhiteSolidScreen is onGreenSolidBattery is chargedWhiteBlinkingRebooting or turning onOrangeSolidBattery is chargingPurpleBlinkingPerforming factory resetRedSolidBattery is low	Color	State	Indication	Color	State	Indication
WhiteBlinkingRebooting or turning onOrangeSolidBattery is chargingPurpleBlinkingPerforming factory resetRedSolidBattery is low	White	Solid	Screen is on	Green	Solid	Battery is charged
Purple Blinking Performing factory reset Red Solid Battery is low	White	Blinking	Rebooting or turning on	Orange	Solid	Battery is charging
	Purple	Blinking	Performing factory reset	Red	Solid	Battery is low

#### Controllers

No light None Battery is not charging



	Color	State	Indication
	White	Solid	Controllers are on
	White	Blinking	Controllers are in pairing mode





### **Oculus Quest 2: Accesories**



## **Oculus Quest 2: Setup**

- Facebook account required.
  - Recommended: one account per device.
- Install the Oculus app in your phone.
- Enable Bluetooth and Wifi.
- Start Facebook with your account.
- Start Oculus and login with your Facebook account.
- Continue with your headset where most of the setup procedure will take place.





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## **Oculus Quest 2: Setup**

- Remove previously the battery tabs from controllers.
- Adjust the head strap (feel comfortable)
  - Two plastic toggles at the back.
  - Tighten the strap over the top.
- Begin the setup process (headset).
  - Press and hold the power button for 2 s.
- Touch controllers should pair automatically.
  - Use controllers as pointers.
  - Use triggers as selectors.









## Inside the headset: Setup



Preferred language.





- Setup your IPD (interpupillary distance).
  - Move manually the lenses.
- Wifi setup (password).







## Inside the headset: Setup



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- View the safety video:
  - Indoor use only.

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- Ensure your play space is clear of obstructions.
- Set a guardian boundary.
- Comfort settings: Comfortable, Moderate & Intense.
- Initial update: headset & controllers (~5min).



### Pair headset to mobile app







• Guardian boundary detected only if you are inside after having defined.

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- Designed to notify you the edges of your play space when you are in VR to prevent you from bumping into walls or furniture.
  - 1. Set your floor level by lowering the controller to the floor. Confirm by pressing the trigger.

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2. Draw the boundary outline of your play space using the pass-through mode.

Augmented reality:

Black and white the real world.









3. When you need to use again the play area, you may encounter some objets in it: redefine or redraw.



### Stationary guardian system



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### You can switch to stationary boundary when you need to define your play area.



### **Universal Menu**











### **Quick Settings**





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## **Quick Settings**



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## Home environment: Essentials

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# Essentials: Virtual Environment VRALEXIA



Change Virtual Environment Select the background you would like to



Change Virtual Environment 👘 🗙 Takes about 2 minutes Select the background you would like to see as the default home environment in VR. You can always change your virtual environmen...

#### ttings

evice

Guardian

Storage

Notifications

Applications

Accessibility

Virtual environment



Virtual environment

















# Essentials: Virtual Environment

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Change Virtual Environment Select the background you would like to see as the default home environment ... PRESS THE OCULUS BUTTON TO HIDE THE MENU AND ENJOY YOUR ENVIRONMENT!


#### **Essentials: Friends**

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#### **Essentials: Tutorials**







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## **Essentials: Tutorials**



- Get familiar with:
  - Guardian system.
  - Touch controllers.
- Virtual hands:
  - Make a fist.
  - Point.
- Actions:

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- Push button.
- Pick up an object.
- Drop an object.







# Insert a cartridge into the console.





#### **Essentials: Tutorials**











#### **Essentials: Store**



- Games
- Apps
- Experiences







## Home environment



- Explore: find new apps and services
- More From Your Apps: content and updates from apps you already have downloaded
- Entertainment: lists popular VR entertainment you could browse
- Friends Activity: stay up to date with what your linked Friends are doing in VR
- Saved: where you can store any media, apps or other items









# **VR Oculus Tips**







## Contents

#### Oculus App

Sharing

Hand Tracking

Passthrough

App Lab

Developer Mode

Factory Reset











## **Oculus App**

#### • Download the Oculus App.

#### Connect & Pair Oculus Quest 2 in your smartphone.





## **Oculus** App





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## Wifi connection



- Wifi account for the course.
  - User: Vrailexia2022
  - Pass: 2022Vrailexia
- Eduroam (directly from your Oculus)
  - Run geteduroam from Unknown Sources.
  - Select your institution from the list.
  - Provide your username and password.











# Sharing

- Cast
- Take Photo
- Record Video











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## Sharing: Cast (social screen)

• Cast



You can stream videos on your local network or devices (smartphone, computer, TV [chromecast],...).









Cast



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## Sharing: Cast (social screen)



#### **RED DOT IN YOUR OCULUS HEADSET**



## **Sharing: Screenshot**

- Take Photo BLINKING RED DOT IN YOUR OCULUS HEADSET
- After some seconds the screenshot is taken.
- 1024x1024 JPEG image.







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## **Sharing: Video Capture**

• Record



- You can include mic audio in your recording.
- To finish press button record again.
- Its aspect ratio by default is 1:1.



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The recorded videos and photos are saved in the headset
itself.

- You can connect Oculus Quest 2 to your computer and download videos for editing and sharing with others.
- You do not need additional software.
- Attach your headset to your computer.





# Sharing: Transfer



- Wear the headset and agree to the prompts to let your PC access the headset.
  - If there is no prompt, it implies that the headset is not connected properly.



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## **Sharing: Multiple Accounts**





- You can log In To Multiple Accounts & Share Apps.
- Head to "Settings" on your Oculus Quest/Quest 2 headset and select the "Accounts" tab.
- Select "Add Accounts" to connect a second, third, or fourth login together with your previous Admin account.
  - You can secure your private information using a standard security pattern
- [OPTIONAL] Turn on "App Sharing" to allow other accounts access to your paid library (this will not overwrite any of your existing saves).



## Hand tracking



- Hand Tracking works by using the inside-out cameras.
- Your headset will detect the position and orientation of your hands and the configuration of your fingers.
- Once detected, computer vision algorithms are used to track the movement and orientation of your hands.



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### Hand tracking: On/Off





### Hand tracking: On/Off



### **Enable Hand Tracking**



• Put down your Oculus Touch controllers.



## Hand tracking: gestures



• Point and Pinch: to select something.







## Hand tracking: gestures



• Pinch and Scroll: scrolling in any direction.







## Hand tracking: gestures



#### • Palm Pinch: right (Oculus button), left (Menu button).







## Spatial perception



- Settings > Experimental > Space sense.
  - See outlines of people and things within your roomscale boundary to increase your awareness of your surroundings while you are in VR.









## Passthrough



- Feature that allows you to step outside your view in VR to see a real-time view of your surroundings.
- It comes up automatically when you are creating or adjusting your Guardian.
- Apps can also show Passthrough to blend your physical and virtual environment.
- When apps show Passthrough, only you can see it. Apps can't access images or videos of your real surroundings.







#### Passthrough



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#### **Passthrough shortcut**



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Double-tap left or right-hand side

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- A new way for you to distribute apps directly to consumers safely and securely, via direct links or platforms like SideQuest, without requiring store approval.
- App Lab lets you get an app directly to your community, even if it is early in development, experimental, or aimed at a unique audience.
- Apps from App Lab will appear in your Quest

library.







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- App Lab apps can also be searched by exact name and found in the "App Lab" section of results.
- Example: "First steps with hand tracking"







- Once an app has been published, you can share it with customers via a URL.
- This link opens the app product description page directly, displaying information, trailers, screenshots, and an option to purchase or install the app.
- <u>https://www.applabdb.com/</u>
- You can also generate Oculus Keys, which can be redeemed for a free copy of the application, for a more controlled release.






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- To allow installing apps & games to your headset we need to enable developer mode.
- To do this, you have to be a registered "developer" on the Oculus website.

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https://developer.oculus.com/manage/



• This process is free, quick and easy to setup.







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### • You need to create an 'organization'.

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**Org Manager** 

### RVA Studios -

- You'll first be asked to accept the developer agreement.
- You will then need to verify your account using either a credit card or a phone number.







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### O OCULUS FOR DEVELOPERS

Organizat	tion Name
What is the Note: The na	e legal name of your organization? ame you choose here will be displayed publicly in the store.
Please e	nter a name (ex: Tuscany Studios)
We are the development of the de	happy to see that you're interested in developing for Oculus. Creating your developer organization for your Oculus account enables you access to features that are elopment of VR experiences. Remember that you have agreed to the Oculus Terms of Service and we may take action against violators. Please be a responsible m community. nderstand pured

To be an Oculus developer, you must establish your identity by providing a credit card or mobile number. If you remove this information, your account will no longer be verified. Learn More

Y	ou have successfully verified your Oculus developer ad	count
	Back to Home	

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Account Manager

Select Organization

Vennuauun

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• ADB Drivers (only Windows)

https://developer.oculus.com/downloads/package/oculus-go-adb-drivers/

• The Oculus Go drivers work for the quest also. To install the drivers extract the zip folder, right click the android\_winusb.inf file and click install.





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- Now that you're a "developer", open the Oculus app on your smartphone or tablet.
- In the Devices icon, tap on the headset and tap 'Developer Mode' to enable it.
- Once you have enabled developer mode it is a good idea to reboot your headset to be able to see it on the device.





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My Quest 2 Y

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## **Oculus Developer Hub**



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- <u>https://developer.oculus.com/documentation/unity/ts-odh/?locale=en\_EN</u>
- Oculus Developer Hub (ODH) is a standalone companion development tool that positions Oculus Quest and Oculus Quest 2 headsets in the development workflow.
  - No need for wired connection as you can now connect your headset to the computer over WiFi
  - Disable the proximity sensor and guardian for an uninterrupted testing workflow
  - Capture screenshots and record videos of what you see in the headset for debugging purposes
  - Deploy apps directly to your headset from your computer
  - Upload apps to the <u>developer dashboard</u> for store distribution
  - Share your VR experience by casting the headset display to the computer
  - Download the latest Oculus tools and SDKs you need to build apps
  - Check device logs for debugging purposes









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## **Oculus Developer Hub**

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## **Oculus Developer Hub**



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- SideQuest is a tool that allows you to perform or enable additional functions with your Oculus Quest that are generally not accessible or possible to do directly on the headset itself.
- SideQuest offers methods to install new content onto your Quest, as well as alter some headset settings that aren't available natively.
- <u>https://sidequestvr.com/</u>









- <u>https://sidequestvr.com/setup-howto</u>
- Developers are able to get their apps listed on SideQuest, either as an App Lab listing or as an app that requires sideloading.
- Users can browse and install this library of non-Store content onto their Quest using SideQuest.
- In relation to Quest, sideloading refers to the process of loading content onto the device that is not approved or verified by Oculus and does not appear on the Oculus Store.











### Adjusting Headset Settings

- SideQuest also allows you to change several hidden settings of the Quest, such as recording quality and resolution for video capture, text size and more.
- SideQuest > Device Settings and Tools











- SideQuest Folders.
- Proximity Sensor.
- Experimental Mode.
- Refresh Rate.
- Chromatic Aberration.
- Guardian.
- Full Rate Capture.

- Paste text to your device.
- FFR (Fixed Foveated Rendering ) level.
- Video Capture Size.
- CPU and GPU level.
- Default Texture Size.









- SideQuest can also be used to manage the internal files on your headset, along with the installed apps.
- You can even create backups of the apps and save files, so that you can restore your progress if you have to factory reset your device or switch headsets.



## **Factory Reset: Phone**



- 1. Open the Oculus app on your phone.
- 2. Tap the 'Menu' button from the bottom menu.
- 3. Tap the 'Devices' button to open your set of devices.
- 4. Tap 'Advanced Settings' under Headset settings.
- 5. Tap Factory Reset.
- 6. Tap Reset on the confirmation message.







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## **Factory Reset: Phone**





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*	< Advanced Settings
<b>**</b> -	Automatically Upload Crash Reports
Suo All	Public Test Channel
ou-capture in VR will sure (nat synding le froadsol	Receive early versions of device firmware before public release. For more information, click here
	Tracking Frequency
	Troubleshoot tracking problems by selecting the power frequency of sockets in your region
	Factory Reset
_	

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## **Factory Reset: Headset**



- Press the hold the 'Power' and 'either volume button' until the screen lights up. You will now see Quest 2's recovery screen.
- 2. You cannot use your controllers here. So use the volume buttons to navigate to the 'Factory Reset' option and press the power button to select it.
- 3. You will be met with a confirmation warning. Use the volume button to select 'Yes, erase and factory reset'.







### **Factory Reset: Headset**



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use which may be made of the information contained therein.









# VR Apps Analysis





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### Contents

Age and comfort.

Rating and supported devices.

Categories and genres.

Supported Player modes.

Analysis.

Installation features.









## **VR Apps Analysis**

### Age (IARC Ratings Definitions, e.g. PEGI).

- $\,\circ\,$  International Age Rating Coalition.
- <u>https://www.globalratings.com/ratingsguide.aspx</u>



#### **Comfort rating:**

- **Comfortable** experiences are appropriate for most people.
- **Moderate** experiences are appropriate for many but certainly not everyone.
- Intense experiences are not appropriate for most people, especially people new to VR.
  - **Unrated** experiences may contain intense content, which may not be appropriate for most people, especially those who are new to VR.



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## **VR Apps Analysis**

### Ratings (from 1 to 5 stars).

- Number of ratings.
- Reviews (Time ago, helpful, percentage distribution).

#### VR devices supported.

- Supported platforms.
- What headsets the app can be used on, once you own it.

#### Game modes.

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• Single User, Multiplayer, PvP, Coop...

#### Supported controllers.

Oculus Touch, Hand Tracking, Xbox controller,...









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## **VR Apps Analysis**



Games, Experiences, Entertainme

#### Genres.

- Productivity
- Art/Creativity
- Exploration
- 360 Experience
- Utility
- Social
- Food
- Movie
- Music

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- Adventure
- Narrative
- Sports
- Racing
- Casual
- Action
- Shooter
- Puzzle
- Strategy
- Arcade

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### **Supported Player Modes**

 Player modes let you know what types of player movement an app, game or experience supports. If more than one player mode is supported, you will see more than one option listed. Some modes may require additional configuration or equipment.





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### **Supported Player Modes**

- Sitting apps can be played while sitting and it is recommended a play space with 1 meter (3 feet) of free room in all directions around where you are sitting. It is also recommended using a rotating desk chair.
- Standing apps can be played while standing and may require a small amount of movement. It is recommended a play space with 1 meter (3 feet) of free room in all directions around where you are standing.
- Roomscale apps and games require you to move anywhere in your play space. A minimum play space of 2 x 2 meters (6.5 feet by 6.5 feet) is needed, but some apps may require a larger player space.





# VR Apps Analysis



Graphics:

• Pretty good, Good, Not realistic but still looks good...

Gameplay:

• Incredibly fun, decently fun, it will keep you entertained for a while...

Fear factor:

• Change of pants, shaking the whole time, bit freaky, not scary...

Replayability:

• Every day for hours, once every few days, maybe once a week,...

Difficulty:

• Rage quit, make you mad, occasionally will make you ticked off,...







 Depending on the version some features will be or will not be available, some problems could not appear, the app could have been improved.

In-App Purchases and downloadable content.

 $\,\circ\,$  New content for users in addition to the app.

Permissions and Terms of Service.

Developer and Publisher.

Website and Release Date.

Sharing.

Log into the Quest 2 using your admin account. Select Settings (gear icon) > Accounts > toggle on App Sharing. You can
add up to three accounts to an Oculus 2. These secondary accounts can play apps owned by the admin account.







# Thank you for your attention. Any questions?



